WHAT IS CLAIMED IS:

1. A radio-frequency amplifier comprising:

a transistor having an input terminal, an output terminal, a control terminal, and a transconductance g_m;

a series-connected feed-through resistance R_f and feed-through capacitance C_f connected in parallel with the input terminal and the output terminal of the transistor;

a load resistance R_L connected to the output terminal of the transistor; and

wherein the control terminal of the transistor is biased at a fixed voltage.

2. The radio-frequency amplifier of claim 1 further comprising a tank circuit connected between a voltage source V_{dd} and the input terminal of the transistor.

3. The radio-frequency amplifier of claim 1 driven by a signal source with output impedance R_s, wherein the transconductance g_m of the transistor is larger than $1/R_s$.

4. The radio-frequency amplifier of claim 1 wherein the feed-through resistance R_f is formed by a real resistor R_P in parallel with the transistor drain-source small-signal resistance r_{ds}.

5. The radio-frequency amplifier of claim 3 wherein the feed-through resistance R_f further comprises an inductance L_P.

6. The radio-frequency amplifier of claim 6 wherein the transistor and a signal source impedance R_S satisfy the equation:

$$g_m = \frac{1}{R_s}\left(\frac{\delta\alpha}{\gamma}(1+\chi)^2\eta(\omega_0)+\eta^2(\omega_0)\right)^{-\frac{1}{2}}$$

where

δ = a gate noise coefficient of the transistor,

α = a ratio of g_m to a channel conductance at zero drain-to-source voltage of the transistor, g_{d0},

γ = a channel thermal noise coefficient of the transistor,

χ = a ratio of a backgate transconductance g_{mb} of the transistor to g_m,

ω_o = an operation frequency, and

$\eta(\omega_o)$ = a ratio of a gate admittance g_g of the transistor to g_m.

7. The radio-frequency amplifier of claim 1 wherein the tank circuit comprises a parallel combination of a resistance, a capacitance, and an inductance.

8. A high-frequency CMOS low noise amplifier comprising:

a first stage including a common-gate amplifier with a feed-through resistance R_f;

a second stage coupled to the first stage including a common-source amplifier with inductive degeneration; and

a third stage coupled to the second stage including a common-source amplifier with inductive degeneration.

9. The high-frequency CMOS low noise amplifier of claim 8 wherein the feed-through resistance R_f is formed by a resistance R_P in parallel with a transistor drain-source resistance r_{ds}.

10. The high-frequency CMOS low noise amplifier of claim 8 wherein the feed-through resistance R_f further comprises an inductance L_P.

11. The high-frequency CMOS low noise amplifier of claim 8 driven by a signal source with output impedance R_s, wherein a transconductance g_m of the input transistor is larger than $1/R_s$, a series-connected resistor R_f and capacitor C_f is connected between the input terminal and the output terminal of the input transistor, so that the real part of an input impedance of the high-frequency CMOS low noise amplifier is increased.

12. A radio-frequency amplifier comprising:

a common gate amplifier having an input and an output; and

a resistive feed-through circuit having a resistance R_f coupled in parallel with the output of the common gate amplifier, wherein the resistive feed-through circuit reduces output noise power.

13. The radio-frequency amplifier of claim 12 wherein the resistive feed-through circuit further comprises an inductance L_P.

14. The radio-frequency amplifier of claim 12 wherein the resistive feed-through circuit comprises a feed-through resistance R_P and a feed-through capacitance C_P.

15. The radio-frequency amplifier of claim 12 wherein the common gate amplifier and a signal source impedance R_S satisfy the equation:

$$g_m = \frac{1}{R_s}\left(\frac{\delta\alpha}{\gamma}(1+\chi)^2\eta(\omega_0)+\eta^2(\omega_0)\right)^{-\frac{1}{2}}$$

where

g_m = an amplifier transconductance,

δ = a gate noise coefficient of the amplifier,

α = a ratio of g_m to a channel conductance at zero drain-to-source voltage of the amplifier, g_{d0},

γ = a channel thermal noise coefficient of the amplifier,

χ = a ratio of a backgate transconductance g_{mb} of the amplifier to g_m,

ω_o = an operation frequency, and

$\eta(\omega_o)$ = a ratio of a gate admittance g_g of the amplifier to g_m.